

Promoting and inhibiting factors for the use of validated dietary assessment questionnaires in health check-up counseling: from occupational health nurses and dietitians' perspective

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Abstract: A validated questionnaire is not typically used for dietary assessment in health check-up counseling provided by occupational health nurses in Japan. We conducted a qualitative study to investigate the barriers and promoting factors affecting the use of validated questionnaires. Ten occupational health nurses and three registered dietitians, working at a health insurance society, were recruited for this study using an open-ended, free description questionnaire. Inhibiting factors, such as “Feeling of satisfaction with the current method,” “Recognition of importance,” and “Sense of burden from the questionnaire”, and as promoting factors, “Feeling the current method is insufficient”, “Recognition of importance,” “Reduction in the feeling of burden after the answer,” “Expectation of and reaction to the result,” and “Expectation for the effect of the counseling” were noted. Since a standardized dietary assessment method in health counseling might be desirable for the harmonization of work with diseases prevention in an occupational field, findings in this study could propose appropriate targets to reduce confusion in health professionals’ concerning the use of validated questionnaires.

Key words: Dietary assessment, Counseling, Occupational health nurse, Qualitative study, Health check-up

Introduction

Questionnaires are widely used in research and assessments because this method can reduce cost and is more efficient when compared to other methods, such as an interview¹⁾. For the assessment of diet, structured questionnaires which ask the frequency of foods consumed (i.e.,

food frequency questionnaires: FFQ) or diet history (i.e., diet history questionnaires: DHQ) are used in large prospective studies²⁾. Thompson and Byers³⁾ suggested that dietary assessment methods might allow for the addition of quantitative information. Coates *et al.*⁴⁾ evaluated various dietary assessment methods for food fortification programs. They included 24-h recalls, FFQs, and national surveys and evaluated the suitability of each measure based on its validity, usefulness, and cost (resources). According to their evaluation, FFQs could assess an individual’s typical diet, and were less time-consuming and less expensive than a 24-h recall⁵⁾. Therefore, FFQs, DHQs and other

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short types of dietary assessment questionnaires (screeners) were often used to assess long-term usual diet in researchers as well as clinical situations in other countries^{2, 6–10}.

Instead, close-ended questions about diet and dietary habits are adopted in the health guidance program in 2018 from the Ministry of Health, Labour and Welfare in Japan¹¹). Dietary assessments by dietitians are recommended if necessary. These yes-no type questions might not be adequate to evaluate changes in detail. Moreover, a few days dietary records are often used by dietitians in Japan as a dietary assessment method. However, food records are generally not recommended to evaluate changes in the diet of an intervention because there is the possibility that transient changes in behavior occur when a person keeps records^{6, 12}). In addition, the assessment of habitual food and nutrient intake requires a food record of more than a few days⁶). In the United Kingdom, the National Obesity Observatory described in their report that using a validated questionnaire was a strong option to measure dietary intake in public health interventions¹³). Thus, evidence-based dietary questionnaires, which are often used in epidemiological studies, might overcome these drawbacks of the current method with several focused questions and unspecified dietary assessment by dietitians. It should be noted that further research is required to compare the efficiency or cost-effectiveness of a comprehensive dietary questionnaire and focused questions with unspecified dietary assessment in health guidance. There is a study that measurement of dietary change was assessed and compared between FFQ and 24-h recall among breast cancer survivors and both tools captured differences¹⁴), and this kind of research in health guidance in Japan is also desirable in the future.

In Japan, public or occupational health nurses and registered dietitians working at health insurance societies conduct health guidance based on the results of health check-ups. This health check-up is usually performed annually for workers of each company. It is possible that dietary assessment questionnaires could be used in this health guidance as part of information gathering. Therefore, we conducted a qualitative study to investigate the barriers and promoting factors to the introduction of questionnaires for dietary assessment, especially in nurse's health guidance and the nutritional counseling in occupational field for the harmonization of work with employees' diseases prevention.

Methods

Data collection

In March 2016, 10 occupational health nurses and three registered dietitians, working at a health insurance society, were recruited for a qualitative study, using an open-ended, free description questionnaire. Participants who had experience performing health guidance or nutrition counseling were included. The questionnaire included 12 questions about dietary assessment experience and the impression and opinions of the participants regarding the use of questionnaires for dietary assessment. The dietary assessment questionnaire that was suggested for use was named as a brief, self-administered diet history questionnaire (BDHQ). A BDHQ is a four-page, structured questionnaire that includes 102 questions about nutrient intake, food intake, and dietary behaviors. Validation studies for BDHQs have been previously reported^{15, 16}). Participants answered the BDHQ and obtained a result sheet before answering the open-ended questionnaire. In the result sheet, signals about the number of nutrients consumed are shown on the first page. Detailed results (e.g., the number of nutrients consumed, the food group sources for these nutrients, and graphs about the consumption of food groups, which can be compared with the average Japanese population) followed on the second page. The researcher explained the purpose of the study and distributed the questionnaire to all participants. Participants completed the questionnaires at home. Since the number of dietitians was limited and there seemed to be no difference in opinions between nurses and dietitians, two job categories were not distinguished for analyses.

Data analysis

Context analysis is used to analyze documents and describe phenomena objectively. In inductive context analysis, *open coding*, *creating categories*, and *abstraction* are the main processes to organize data. In the open coding step, headings are defined while reading the text. The answers participants wrote were read repeatedly and word for word. During the repeated reading, codes were derived and sorted into categories. Categories were created by how they were related or belonged to a group, and all subcategories were combined into categories. Definitions for these categories were developed and the categories were named with content characteristic words. In the abstraction step, the general description was formulated from the categories created. These processes were conducted by the author in the present study. The trustworthiness of a content analysis

Table 1. Basic characteristics of participants

Participant	Occupation	Years of experience	Other experience
A	Registered dietitian	≤5	Clinical dietitian
B	Occupational health nurse	5–10	
C	Occupational health nurse	20≤	
D	Occupational health nurse	5–10	Hospital nurse
E	Occupational health nurse	20≤	Hospital nurse
F	Registered dietitian	5–10	Clinical dietitian
G	Occupational health nurse	20≤	
H	Occupational health nurse	≤5	
I	Occupational health nurse	≤5	
J	Occupational health nurse	20≤	
K	Occupational health nurse	≤5	
L	Registered dietitian	10–15	
M	Occupational health nurse	≤5	

was considered according to the papers by Elo *et al.*^{17, 18}. For credibility, the author had conversations with participants before the explanation of the purpose of the study. Participants were asked to comment on the results of the study and all agreed with the findings. For confirmability, an expert in the field of dietary assessment was asked to confirm the relevance of the codes and findings.

Ethical considerations

All procedures of the study were approved by the ethics committee in authors' affiliated institution. (Approval no. 11284). The study purpose, protocol, and rights for withdrawal and confidentiality were explained to the participants by the researcher orally, as well as with a document, and written informed consent was obtained from each participant.

Results

The characteristics of participants are shown in Table 1. All were female, with three registered dietitians included. The mean years of experience were 12.2 ± 9.9 yr.

Inhibiting factors

Main categories, subcategories, and codes about inhibiting factors of using dietary questionnaires in health guidance are shown in Table 2. Three main categories, with eight subcategories, were extracted. Main categories included 1) Feeling of satisfaction with the current method, 2) Recognition of importance, and 3) Sense of burden from the questionnaire.

A Feeling of satisfaction with the current method

The first category for inhibiting factors was "A Feeling of satisfaction to the current method." Some public health nurses and dietitians thought that the present method was adequate or sufficient in their counseling. There were three subcategories, including "Time constraints," "Burden and the degree of understanding of the counseled individuals," and "Compensation with one's ingenuity and skills."

Time constraints. The participants felt that the current method was reasonable to obtain information in the restricted amount time available for counseling. Participants provided the following statement regarding this issue (an alphabet in a parenthesis is according to Table 1):

Counseling time is limited. The current method is reasonable to obtain information in the restricted amount of time. (A)

Burden and the degree of understanding of the counseled individuals. The participants mentioned that the burden of the current method was not large and that a difficult method might be impossible to use because of the comprehension level of the counseled individuals.

Compensation with one's ingenuity and skills. Since many participants felt the current method was insufficient to obtain some information, they compensated information with their interview techniques and gathered the information that they wanted. The techniques utilized by participants were different from each other in detail and may have led to differences in counseling level.

Recognition of importance

There were two subcategories in this category: Other important things and lack of motivation.

Other important things. Some participants specifically

Table 2. Inhibiting factors for using a dietary assessment questionnaire

Main category	Subcategory	Codes
Feeling of satisfaction with the current method	Time constraints	I can get information in a limited time/It maintains a reasonable level/It is sufficient in terms of finding something related to the goal/I can roughly grasp
	Burden and the degree of understanding of the counseled individuals	Less burden/Workers cannot understand contents that are too difficult/The comprehension of the counseled individual
	Compensation with one's ingenuity and skills	Ask the rhythm of eating, contents, and extrapolated the information/Change the order of questions according to the concerns or knowledge the counseled individual/compare the amount consumed with an elementary school lunch or asked the size of the lunch box/Explain things using simple examples to be used effectively by counseled individuals/Use a dietary record and some add photos/Asked food, cooking method, and seasonings in a face-to-face interview
Recognition of importance	Other important things	One of top 3 things/1/4–1/3 (Physical activity, recreation, sleep, mental health, and smoking-alcohol/It depends on the situation)
	Lack of motivation	I am not convinced of its importance
A sense of burden from the questionnaire	A Heavy burden at first glance	Tiresome/Many questions/I decided that I would answer when I had more time/ Answering the frequency of eating food was difficult
	Anxiety concerning accuracy	I did not answer the amount of food in the questionnaire/I am worried that the results of the questionnaire may be inconsistent with the result of health checkups/I do not have confidence in answering properly/The amount could not be known/I could not answer accurately/I think it did not grasp all of my eating habits/I had only vague memories
	Detailed results	There was too much data presented in the result sheet
	An impression that not everything can be conducted by themselves	Analyzing the data requires the cooperation of specialized organizations/ We need trainings to use

mentioned that there were other things as important as dietary assessment in health guidance. A statement regarding this subcategory was as follows:

(Dietary assessment accounts for) 1/3 to 1/4 of the information necessary. Physical activity, recreation, sleep, mental health, and smoking/alcohol use (are as important as diet in health guidance). (H)

Lack of motivation. One participant answered that he/she had never used the dietary assessment method, even though he/she had learned a method.

A Sense of burden from the questionnaire

Many participants stated holding negative beliefs about the questionnaire, including the level difficulty, burden, and/or anxiety from use. Four subcategories emerged. Specifically, “Heavy burden at first glance,” “Anxiety concerning the accuracy,” “Detail level of the results,” and “Impression that not everything can be conducted by themselves.”

A Heavy burden at first glance. Most participants answered that the dietary assessment looked hard to complete.

Anxiety concerning accuracy. Next, some participants

harbored negative feelings toward the questionnaire, being skeptical about the accuracy of the results. Some pointed that they did not answer the amount of food in the questionnaire and others noted that they could not answer correctly. One of the statements regarding this issue was as follows:

I answered the frequency, but did not answer the amount, so even if I eat only a few vegetables every day, the questionnaire regards as “Eat every day.” I am worried that the results of the questionnaire may be inconsistent with the results of a health checkup. (A)

Detailed results. Although many participants wrote about the detailed results in a positive context, one participant wrote that too much data was contained in the result sheet.

An Impression that not everything can be done by themselves. Some participants pointed out that they thought using the dietary assessment requires outsourcing, or, at least needs special training for use.

Promoting factors

Similar to inhibiting factors, promoting factors in using the dietary assessment questionnaire in the health

Table 3. Promoting factors for using a dietary assessment questionnaire

Main category	Subcategory	Codes
Feeling the current method is insufficient	Individuals and items the current method cannot address	Shift workers/Persons who have various day to day dietary habits/I cannot grasp the number of seasonings/I cannot fully grasp the content of diet /It cannot be fundamentally improved/The amount is not objective/Details, such as seasonings, cannot be known
	Self-reporting	The number of foods or seasonings are subjective/Some individuals do not answer the things that they do not want to say/Many do not write in detail/Individuals with obesity tend to under-report
	Entrust to dietitians	I leave it to registered dietitians
	Time constraints	I am exhausted by the routine work and cannot assess data/Time is limited to hearing/Hearing everything is time-consuming/Sometimes, there is not enough time to establish trust
Recognition of importance	Important	Essential/Necessary/it is necessary to advise what food should be increased and what should be decreased/It is particularly important in the health guidance when the goal is losing weight
Reduction of the feeling of burden after the answer	Low burden actually	It was not as time-consuming as I had expected
Expectation and reaction to the results	Interested in the questionnaire before answering	It looks interesting.
	Looking forward to the results sheet	I expect the result will be similar to the subjective assessment
	Surprised by the results	I am shocked to see how much salt I typically intake/I should have answered more accurately because I can get such a detailed result/I realize that I eat a lot of snacks/I am surprised that the results show the amount in grams/I can obtain more detailed information than I expected
An expectation for the effect of the guidance	Visually intelligible	Colors and graphs were easy to understand/It is attractive/Consumption of the food groups can be seen in the graphs/I can focus on the red signals/Counseled individuals can easily know their problems
	Enables objective and specific health guidance	Changes can be seen over the years and are easy to convey/Very detailed results are interesting/Dietary counseling can be based on objective and specific data/This may help individuals change immediately/Foods consumed in excess can be seen specifically/Problems can be elucidated/Dietary habits can be seen objectively and discussed/It increases persuasiveness of instructions and counseled individuals may act positively
	Anticipation for lightening the burden of guidance	It will ease the burden of guidance

guidance are shown in Table 3. Five main categories, 12 subcategories, and corresponding codes are listed. There are five categories for promoting factors as follows: i) Feeling the current method is insufficient ii) Recognition of importance iii) Reduction of the feeling of burden after the answer iv) Expectation and reaction for the result v) Expectation for the effect of the guidance.

Feeling the current method is insufficient

In this category, four subcategories emerged. Specifically, “Individuals and items the current method cannot address,” “Self-reporting,” “Time constraints,” and “Entrusting to dietitians.”

Individuals and items the current method cannot

address. Some participants answered that they could not obtain some information from the current method. One of them felt that the current method could not be thoroughly improved. The statement regarding this subcategory was as follows:

Information obtained only from the interview sheet is not enough. I often ask about ingredients, cooking methods, seasonings, and whether they eat out or cook for themselves. (L)

Self-reporting. Answers for the interview sheet are derived from self-report and individuals sometimes do not answer honestly.

Entrusting to dietitians. One public health nurse answered that he/she asked registered dietitians to assess

dietary contents, rather than rely on the interview sheet.

Time constraints. Some participants complained about the current situation because they do not have enough time to obtain sufficient information and then review their assessment data. A statement concerning this issue was as follows:

Details, such as the amount and the content of dressing cannot be known from the interview sheet, but time is not enough for hearing (such details). So it is not insufficient. (I)

Recognition of importance

In this category, only one subcategory emerged. Almost all participants, other than those who suggested other important points, wrote that dietary assessment is essential and necessary. Some participants added purposes or reasons why it is important.

Reduction of the feeling of burden after the answer

In this category, there was one subcategory, in which participants discussed that the feeling of burden after completing this method was very low. After completion of the BDHQ, a participant mentioned:

Once I finished writing, I felt that it was not as burdensome as I had thought. (I)

Expectation and reaction to the results

In this category, three subcategories emerged. Specifically, “Interested in the questionnaire before answering,” “Looking forward to the results sheet,” and “Surprised at the result.”

Interested in the questionnaire before answering. Although many participants wrote that they felt that the questionnaire was burdensome at first glance, one participant stated a positive impression:

It looks interesting. To start, I would like to try it myself. (M)

Looking forward to the results sheet. The researcher showed a sample of the result sheet to participants before they answered the questionnaire. Although some participants first thought the questionnaire included too many items, they wrote about their expectations for the result sheet.

Surprised by the results. Many participants expressed their surprise when they saw the result sheet. Some discussed their specific dietary content and others mentioned the result sheet itself.

An expectation for the effect of the guidance

This category displayed three subcategories. Specifi-

cally, “Visually intelligible,” “Enables objective and specific health guidance,” and “Anticipation for lightening the burden of guidance.”

Visually intelligible. Signals were shown on the first page of the result sheet and bar charts were used in the other pages. Many participants answered that the colors and graphs were easy to understand and that the target points were clear.

Enables objective and specific health guidance. As well as the perspicuity, many participants noted the objectivity of the results. Some of the participants added that it might be easier for counseled individuals to accept results when they are objective rather than subjective and that the objective results might lead clients to carry out the points that are suggested. Statements regarding this issue were as follows:

We can see the changes over the years and clients may more easily accept the results, because the results are shown in numbers, and are therefore easy to compare. (C)

Anticipation for lightening the burden of guidance. Because of the objectivity, some participants thought that the results could help to change behaviors. Moreover, one participant answered that using the questionnaire and its results could reduce the burden of guidance. He/she wrote:

Although the contents of health guidance do not change, I think it will ease the burden. (H)

Discussion

This qualitative study explored both the positive and negative factors associated with introducing a dietary assessment method in health guidance. As inhibiting factors, thinking that the current method was enough and that the new method seemed difficult, were noted. On the other hand, other participants thought the current method was not enough to assess diet and positively accepted the new method. These findings reveal the points of confusion for nurses and dietitians and the elements that require added explanation for a new tool, specifically when used in health guidance or other health education programs.

This paper might help to show how health professionals feel for a new tool in a program. So far, no dietary assessment tool was introduced in the revised version of health guidance program in Japan¹¹⁾. In the US, an evidence-based program introduces a list of several evaluate instruments. For example, in Supplemental Nutrition Assistance Program Education (SNAP-Ed), an evidence-based program that teaches people eligible for Supplemental Nutrition Assistance Program (SNAP, a Federal program

for low-income individuals and families) about good nutrition, there is a list of survey tools which are already published, and evaluators are recommended to choose one or more measures in the list¹⁹⁾. Factors shown in this paper might be useful to make such a list in Japan in the future.

In terms of the recognition of the current method (both positive and negative attitudes), participants felt some frustration for the current interview sheet and compensated through their interview/listening skills. In the present study, nurses and dietitians with 10 yr of experience or more tended to discuss the techniques used in detail. If the new method is used, individuals with more experience may reject the new method, as some of their acquired skills may become unnecessary, and they would have to change from a method with which they are familiar. However, among the participants in this study, nurses and dietitians with less than 5 yr of experience tended to answer that the current method was enough under the limited time available, and also expressed anxiety about the accuracy of the results in the new method, while participants with more experience discussed the prospects of positive possible outcomes if they were to use the new method in health guidance. Therefore, the advantages of the new method and points where their acquired skills can still be used should be explained for the health professionals with long experience. Further, for individuals with less experience, explanations should be provided to eliminate concerns about the validity of the results obtained via the new method. Most participants, regardless of whether they were a nurse or dietitian, answered similarly. However, one nurse answered that registered dietitians were asked to assess dietary contents, rather than use the interview sheet. Detailed dietary assessment methods are taught in schools for dietitians; however, public health nurses may not receive the same level of education as dietitians and thus, may practically acquire their skills for the dietary assessment. Using the questionnaire might be useful for maintaining a standard level of dietary assessment in both nurses and dietitians that perform health guidance.

Regarding the usage in health guidance, some participants stated concerns about the accuracy of the questionnaire and worried that they could not handle the system of the questionnaire. One participant wrote that using the dietary assessment system that was used in this study requires the support of experts. In the US, there is an automatic 24-h recall tool called “Automated Self-Administered 24-h dietary assessment tool” (ASA24), a web-based, automatically coded, self-administered 24-h recalls that health professionals can use for free²⁰⁾. To use

a comprehensive dietary assessment questionnaire, such a tool is desirable in the future.

On the other hand, there were positive reactions for the result sheet. Many participants listed the two main advantages; specifically, that the result sheet was visually understandable and the results were objective. These may lead to the lightening of the burden of guidance. In a separate study conducted by our group, workers answered that they could understand their dietary problems when they got their result sheets. A review and a systematic-review mentioned that, although not all graphs are more intuitive than text, and the effectiveness of graphs depends on the situation, visuals might help in a communication of risk^{21–23)}. Some participants wrote that the signal was visually understandable and could be useful in clarifying the ultimate goal.

There are some limitations that warrant mention in this study. First, there is not enough evidence what dietary assessment method is effective in health guidance. Although this study focused the validated comprehensive dietary questionnaire and picked up factors health professional would face, further research for the effect of the difference in dietary assessment method in intervention is required. Second, although there are several types of validated dietary assessment questionnaires in Japan which are mainly developed for research use^{24–29)}, we selected one questionnaire. It should be considered which questionnaire is suitable when it is conducted in health guidance. Results of this study may be partly helpful for this. Third, participants belonged to one health insurance society. If many health insurance societies were included in the study, the dietary assessment method may differ among societies, resulting in more varied impressions. In this study, the limiting of participants was purposeful because the questionnaire was to be compared to only one current method. A future study including a wide range of health professionals is required.

In conclusion, this study presents promoting and inhibiting factors of dietary assessment questionnaire used. Facing a new tool, time and burden were mainly considered by public health nurses and dietitians. Since an evidence-based health program in other country introduces validated or published dietary assessment tools as a list, factors revealed in this study might be helpful to consider which dietary assessment instruments should be introduced for such a list. Further research on the effectiveness of dietary assessment methods is required.

Conflict of Interest

The authors have no conflict of interest to declare.

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